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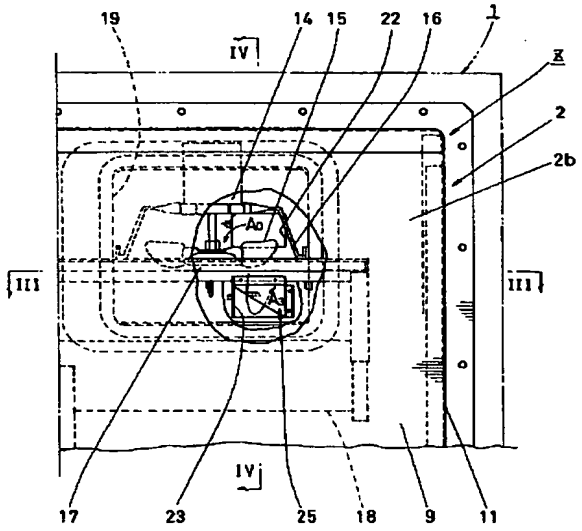
(54)【発明の名称】　コンテナ用冷凍装置の換気構造

(57)【要約】

【課題】　冷却効率の向上と換気量の増大要求への対応及び換気量の調整の容易さを共に実現し得るコンテナ用冷凍装置の換気構造を提案する。

【解決手段】　ケーシング２に、ファン１５の吸込側と庫外とを連通する換気用の吸込口２２と、上記蒸発器１８の一次側と庫外とを連通する換気用の吹出口２３をそれぞれ形成することで、上記吸込口２２から吸い込まれた外気と庫内を循環した後の庫内空気との混合空気の一部が蒸発器１８において熱交換作用を受ける以前に排出空気として吹出口２３から庫外に吹き出され庫内換気が行われ、上記蒸発器１８において排出空気の熱交換を行わない分だけ庫内冷却に関与する空気に対する冷却作用が促進され冷却効率が向上する。また、この場合、上記吸込口２２及び吹出口２３を上記ファン１５の回転方向前方側で且つ該ファン１５に近接する位置に設けて「動圧換気」を実現するとともに、上記吹出口２３の上流側端部の近傍に流通制御部材２５を設けることで、「動圧換気」による換気量の増大効果と、安定した換気作用と容易な換気量調整とが実現される。



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【特許請求の範囲】

【請求項１】　コンテナ（１）に設けた開口部（１ｂ）に該開口部（１ｂ）を閉塞する如く取り付けられるケーシング（２）の庫外に臨む前面（２ａ）側の下部に凝縮器（４）を、庫内に臨む背面（２ｂ）側の上部に蒸発器（１８）を、それぞれ配置する一方、上記蒸発器（１８）の上方位置にファン（１５）を配置し該ファン（１５）により庫内空気を上記蒸発器（１８）の上方に位置する一次側から下方に位置する二次側に向けて貫流させ得る如くしたコンテナ用冷凍装置において、

上記ケーシング（２）に、上記ファン（１５）の吸込側と庫外とを連通する換気用の吸込口（２２）と、上記蒸発器（１８）の一次側と庫外とを連通する換気用の吹出口（２３）を、それぞれ形成したことを特徴とするコンテナ用冷凍装置の換気構造。

【請求項２】　請求項１において、

上記吸込口（２２）及び吹出口（２３）を、上記ファン（１５）の回転方向前方側で且つ該ファン（１５）に近接する位置に設けるとともに、

上記吹出口（２３）の上流側端部の近傍に、少なくとも上記吹出口（２３）の上記ファン（１５）寄り部位を覆って該ファン（１５）から吹き出される空気流が該ファン（１５）から上記吹出口（２３）側に短絡的に流通することなく迂回状態で流通する如く吹出空気流を制御する流通制御部材（２５）を設けたことを特徴とするコンテナ用冷凍装置の換気構造。

【請求項３】　請求項１又は２において、

上記吸込口（２２）及び吹出口（２３）は、共に矩形の開口形状を有し、該吸込口（２２）と吹出口（２３）とに跨がって配置され且つ該吸込口（２２）と吹出口（２３）の特定の開口縁（２２ａ），（２３ａ）と略平行な方向に移動自在とされその第１移動位置においては該吸込口（２２）と吹出口（２３）とを共に覆ってこれを全閉状態とし、第２移動位置においては該吸込口（２２）と吹出口（２３）とを共に開放してこれらを全開状態とする換気量調整板（２１）によりその開口面積が増減調整されるように構成されていることを特徴とするコンテナ用冷凍装置の換気構造。

【請求項４】　請求項３において、

上記吸込口（２２）及び吹出口（２３）の各開口縁のうち、上記換気量調整板（２１）の上記第１移動位置から第２移動位置側への移動方向においてその後方側に位置する後方開口縁（２２ｂ），（２３ｂ）が、上記換気量調整板（２１）の移動方向に直交する方向に対して所定の傾斜角をもった傾斜縁とされていることを特徴とするコンテナ用冷凍装置の換気構造。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本願発明は、コンテナ用冷凍装置の換気構造に関するものである。

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【０００２】

【従来の技術】従来より、コンテナの庫内冷却用としてコンテナ用冷凍装置が用いられているが、かかるコンテナ用冷凍装置のうち、特に生物輸送に使用されるコンテナ用冷凍装置おいては庫内空気を適度に換気する必要があることから換気手段を設けている。このような換気手段を備えた従来一般的なコンテナ用冷凍装置の構造を、図１４～図１７に基づいて簡単に説明すると、以下の通りである。

【０００３】図１４には、コンテナ１の一端面１ａに取り付けられた冷凍装置Ｚ。の正面図を示している。この冷凍装置Ｚ。は、上記コンテナ１の一端面１ａに設けた開口部１ｂに該開口部１ｂを閉塞する如く取り付けられる略矩形板状のケーシング２を備えている。そして、このケーシング２の両面のうち、コンテナ１の庫外に臨む前面２ａの下部には凹状の前面収納部３を形成し、該前面収納部３内に一対の凝縮器４，４とファン５，５と圧縮機６及びコントロールボックス７を収容している。

【０００４】また、コンテナ１の庫内１ｃに臨む上記ケーシング２の背面２ｂの上部、即ち、上記前面収納部３の上方位置には、背面壁９と天板１０と側板１１，１１により囲繞された背面収納部８が形成されている。そして、この背面収納部８の上下方向中段位置には板状のファンガイド１７が略水平状態で横設されるとともに、該ファンガイド１７の左右一対の円形開口状のガイド部１７ａ，１７ａにはそれぞれファン１５，１５が配置されている。尚、このファン１５は、ステー１６を介して上記ファンガイド１７に取り付けられたモータ１４により回転駆動され、その回転方向は図１６に羽矢印Ｒで示す方向とされている。また、上記背面収納部８の側部の上記ファン１５の吸込側に対応する位置には、該背面収納部８とコンテナ１の庫内１ｃとを連通する開口２４が設けられている。

【０００５】さらに、このファンガイド１７の下方位置には、上記各ファン１５，１５に対応するようにしてそれぞれ蒸発器１８，１８がケーシング２側に向かって下降傾斜状態で配置されている。尚、この蒸発器１８，１８の左右両端には、それぞれ管板４４，４４が取り付けられている。

【０００６】一方、上記ケーシング２の上部の上記各ファン１５，１５に対応する位置には、それぞれ矩形板状のサービス蓋１９，１９が設けられるとともに、これら一対のサービス蓋１９，１９のうちの一方のサービス蓋１９の側方で且つ上記蒸発器１８の管板４４の外側位置には、換気口ユニット４０が設けられている。この換気口ユニット４０は、上記背面収納部８のうちの上記ファンガイド１７及びこれに続く隔壁４５よりも上側に位置する部位（即ち、上記ファン１５の吸込側）を開口２４を介して庫外に連通せしめる吸込口４２と、上記背面収納部８のうちの上記ファンガイド１７及びこれに続く隔

壁４５よりも下側に位置する部位（即ち、上記ファン１５の吸込側）を、上記蒸発器１８を通過し且つその管板４４の下側から該管板４４の外側まで迂回した状態で庫外に連通せしめる吹出口４３と、上記ケーシング２の前面２ａ上に上下方向にスライド自在に設けられてそのスライド位置に応じて上記吸込口４２と吹出口４３とを適宜度合いで開閉することで換気量を調整する換気量調整板４１とで構成されている。尚、上記吸込口４２と吹出口４３は、ともに円形の開口とされている。

【０００７】このように構成された冷凍装置Ｚ。においては、次のようにして庫内の冷却作用及び庫内の換気作用がなされる。即ち、上記ファン１５が運転されると、その吸引作用により庫内１ｃの庫内空気A_1と上記吸込口４２から導入される外気Ａ。とが混合状態で該ファン１５により蒸発器１８の一次側に吹き出されるとともに、この蒸発器１８の一次側に吹き出された空気は、その全量が上記蒸発器１８を通過することで冷却される。そして、この冷却された空気のうちの大部分は、冷却空気A_2として庫内１ｃ側に還流され、庫内の冷却作用を行うとともに、庫内循環後、再び庫内空気A_1としてファン１５側に吸い込まれる。

【０００８】一方、上記蒸発器１８の一次側に吹き出された空気のうちの他の部分は、上記管板４４の下側を迂回して上記吹出口４３から排出空気A_3として庫外に排出される。この吹出口４３からの空気の排出作用と上記吸込口４２からの外気Ａ。の吸込作用とにより、庫内空気A_1の換気が適度に行われるものである。尚、この場合、排出空気A_3はファン１５から吹き出された後、上記蒸発器１８を通過しさらに上記管板４４を迂回して吹出口４３側に流れるものであることから、ファン１５からの吹き出しに伴う動圧は減衰消滅しこれが換気作用に寄与することはなく、換気作用は専ら庫内と庫外との間の静圧差によって行われることになる（即ち、「静圧換気」である）。

【０００９】以上が従来の冷凍装置Ｚ。の構造及び作用の概略である。

【００１０】

【発明が解決しようとする課題】ところが、このような従来の冷凍装置Ｚ。には次のような問題があった。

【００１１】第１の問題は、冷却効率に関する問題である。即ち、この冷凍装置Ｚ。においては、庫外から取り入れた外気Ａ。と庫内１ｃを循環した後の庫内空気A_1とを混合してこれらの全量を蒸発器１８に通して冷却し、この冷却された空気の一部を排出空気A_3として庫外に排出するものであることから、上記蒸発器１８が庫内冷却作用に寄与しない無駄な熱交換作用を行うこととなり、それだけ冷却効率が落ちるものである。

【００１２】第２の問題は、換気量の問題である。即ち、この冷凍装置Ｚ。は、上述のように庫内と庫外との静圧差を利用して換気を行う「静圧換気」であるため、換気量を大きくとるにはファン１５の能力アップが必要であるが、コンテナ１の大きさに制約があることから換気量の増大には一定の限界がある。このため、例えば貨物として球根等の生命体活動を行っているものを輸送するような場合には、これらの要求換気量を十分に確保することができないということも起こり得る。

【００１３】ところで、このような「静圧換気」による換気量不足を解消する方法の一つとして、例えばファン動圧を利用した「動圧換気」により換気量の増大を図ることが考えられる。ところが、動圧換気とした場合には、ファン動圧が吹出口からの吹出空気に直接かかることから、換気量そのものの増大は望めるものの、その反面、例え換気量調整板４１により換気口の開度（即ち、吸込口４２と吹出口４３の開度であり、設定換気量に対応する）を一定に保持していても実際の換気量が設定換気量に一定せずに大きく乱れるとか、設定換気量を変更すべく換気量調整板４１により換気口の開度を調整してもその開度と実際の換気量とが対応せず、場合によっては小さな開度変更によって換気量が予想より大きく変化したり、逆に大きな開度変更にも拘わらず換気量があまり変化せず、換気量の調整操作そのものが困難になるという問題が生じることになる。このような事情から、従来よりコンテナ用冷凍装置の換気方法として「静圧換気」が広く採用され、動圧換気は採用されなかったものである。

【００１４】第３の問題は、換気量調整機能上における問題である。即ち、コンテナ庫内に収容される貨物が生物ぶある場合には該庫内の換気を行うことが必要となるが、その場合における要求換気量は一定ではなく、例えば球根等の生命体活動を行っているものの場合には大換気量が要求されるが、通常の野菜とか果物の場合には少ない換気量で十分であり、しかもこの場合には、小換気量の範囲内で野菜等の種類に応じて換気量の微調整を行うことが要求される。

【００１５】ところで、従来は、図１４に示すように、吸込口４２と吹出口４３とを共に円形に開口させ、これらの開口面積を、スライド移動する換気量調整板４１のスライド量によって増減調整し、もって換気量の調整を行うようにしていた。このため、例えば上記換気量調整板４１により上記吸込口４２と吹出口４３とが共に全閉された状態から、該換気量調整板４１をスライドさせて上記吸込口４２と吹出口４３の開口面積を増加させる（即ち、設定換気量を増加させる）場合、上記吸込口４２と吹出口４３とがその円周上の一点から次第にその弦長を増加させながら開いていくので、例えば上記吸込口４２と吹出口４３とを共に矩形の開口としてような場合に比して、開口初期段階（即ち、小換気量範囲）においては上記換気量調整板４１のスライド量に対する換気量の増加比率が低く、換気量の微調整が容易である。この点は、要求換気量が少なく且つ換気量の微調整が要求さ

れる通常の野菜、果物等の輸送に適した換気量調整機能と言える。

【００１６】ところが、上記換気量調整板４１が最大位置までスライドして上記吸込口４２と吹出口４３とが全開とされた状態においては、これら吸込口４２と吹出口４３が円形の開口であることから、例えばこれを矩形の開口とした場合に比して、上記換気量調整板４１のスライド量の割りには該吸込口４２と吹出口４３の開口面積が少なく最大換気量を十分に確保しにくく、特に球根の輸送時の如く大換気量が要求される場合に問題となる。

【００１７】さらに、上記換気量調整板４１をスライドさせて上記吸込口４２と吹出口４３とを全閉状態から全開状態とする場合、これらの半開状態の近傍においては上記換気量調整板４１のスライド量の変化に対する上記吸込口４２と吹出口４３の開口量（即ち、換気量）の変化が極端に大きくなり、半開状態における換気量の微調整が非常に難しくなる。

【００１８】このようなことから、換気量調整上においては、吸込口４２と吹出口４３の開口初期段階においては換気量の微調整が容易であり、その全開状態では可及的に大きな開口面積を確保することができ、しかもこれらの中間段階においては換気量調整板４１のスライド量の変化に対して上記吸込口４２及び吹出口４３の開口量が比例的に変化するような作動特性が要求されるものである。

【００１９】そこで本願発明では、冷却効率の向上と換気量の増大要求への対応及び換気量の調整の容易さを共に実現し得るコンテナ用冷凍装置の換気構造を提案せんとしてなされたものである。

【００２０】

【課題を解決するための手段】本願発明ではかかる課題を解決するための具体的手段として次のような構成を採用している。

【００２１】本願の第１の発明では、コンテナ１に設けた開口部１ｂに該開口部１ｂを閉塞する如く取り付けられるケーシング２の庫外に臨む前面２ａ側の下部に凝縮器４を、庫内に臨む背面２ｂ側の上部に蒸発器１８を、それぞれ配置する一方、上記蒸発器１８の上方位置にファン１５を配置し該ファン１５により庫内空気を上記蒸発器１８の上方に位置する一次側から下方に位置する二次側に向けて貫流させ得る如くしたコンテナ用冷凍装置において、上記ケーシング２に、上記ファン１５の吸込側と庫外とを連通する換気用の吸込口２２と、上記蒸発器１８の一次側と庫外とを連通する換気用の吹出口２３を、それぞれ形成したことを特徴としている。

【００２２】本願の第２の発明では、上記第１の発明にかかるコンテナ用冷凍装置の換気構造において、上記吸込口２２及び吹出口２３を、上記ファン１５の回転方向前方側で且つ該ファン１５に近接する位置に設けるとともに、上記吹出口２３の上流側端部の近傍に、少なくとも上記吹出口２３の上記ファン１５寄り部位を覆って該ファン１５から吹き出される空気流が該ファン１５から上記吹出口２３側に短絡的に流通することなく迂回状態で流通する如く吹出空気流を制御する流通制御部材２５を設けたことを特徴としている。

【００２３】本願の第３の発明では、上記第１又は第２の発明にかかるコンテナ用冷凍装置の換気構造において、上記吸込口２２及び吹出口２３を、共に矩形の開口形状を有し、該吸込口２２と吹出口２３とに跨がって配置され且つ該吸込口２２と吹出口２３の特定の開口縁２２ａ，２３ａと略平行な方向に移動自在とされその第１移動位置においては該吸込口２２と吹出口２３とを共に覆ってこれを全閉状態とし、第２移動位置においては該吸込口２２と吹出口２３とを共に開放してこれらを全開状態とする換気量調整板２１によりその開口面積が増減調整されるように構成したしたことを特徴としている。

【００２４】本願の第４の発明では、上記第３の発明にかかるコンテナ用冷凍装置の換気構造において、上記吸込口２２及び吹出口２３の各開口縁のうち、上記換気量調整板２１の上記第１移動位置から第２移動位置側への移動方向においてその後方側に位置する後方開口縁２２ｂ，２３ｂを、上記換気量調整板２１の移動方向に直交する方向に対して所定の傾斜角をもった傾斜縁としたことを特徴としている。

【００２５】

【発明の効果】本願発明ではかかる構成とすることにより次のような効果が得られる。

【００２６】①　本願の第１の発明にかかるコンテナ用冷凍装置の換気構造によれば、上記ケーシング２に、上記ファン１５の吸込側と庫外とを連通する換気用の吸込口２２と、上記蒸発器１８の一次側と庫外とを連通する換気用の吹出口２３をそれぞれ形成しているので、上記吸込口２２から吸い込まれた外気と庫内を循環した後の庫内空気との混合空気の一部が蒸発器１８において熱交換作用を受ける以前に排出空気として吹出口２３から庫外に吹き出され、これにより庫内の換気が行われることとなる。従って、例えば熱交換後の空気の一部を排出空気として庫外に排出する従来のコンテナ用冷凍装置に比して、上記蒸発器１８において排出空気の熱交換を行わない分だけ庫内冷却に関与する空気に対する冷却作用が促進され、それだけ冷却効率が向上せしめられるものである。

【００２７】②　本願の第２の発明にかかるコンテナ用冷凍装置の換気構造によれば、先ず第１に、上記吸込口２２及び吹出口２３を、上記ファン１５の回転方向前方側で且つ該ファン１５に近接する位置に設けることで、該ファン１５の動圧を吹出口２３から排出される排出空気に作用させる「動圧換気」を実現しているので、例えば従来の「静圧換気」の場合のようにファン能力の増大を図らずとも、上記吹出口２３からの空気の排出が促進

され、容易に換気量の増大を図ることができるものである。

【００２８】第２に、上記吹出口２３の上流側端部の近傍に、少なくとも上記吹出口２３の上記ファン１５寄り部位を覆って該ファン１５から吹き出される空気流が該ファン１５から上記吹出口２３側に短絡的に流通することなく迂回状態で流通する如く吹出空気流を制御する流通制御部材２５を設けているので、上記吹出口２３から吹き出される排出空気にファン動圧が過度に作用することが防止される。これにより、換気量の乱れが可及的に防止され設定換気量の維持が可能になるとともに、換気口開度と換気量との相関関係がほぼ一定に保持され換気口開度の調整による換気量調整操作が容易ならしめられるものである。

【００２９】従って、この第２の発明にかかるコンテナ用冷凍装置の換気構造によれば、上記①に記載した「冷却効率の向上」という効果とともに、「動圧換気」による換気量の増大効果が得られ、しかも「動圧換気」を採用することに起因する換気量の乱れ及び換気量調整の困難さを解消して、換気量の安定化と換気量調整の容易化とが図れるものである。

【００３０】③　本願の第３の発明にかかるコンテナ用冷凍装置の換気構造によれば、上記①又は②に記載の効果に加えて次のような効果が得られる。即ち、この発明では、上記吸込口２２及び吹出口２３を、共に矩形の開口形状を有し、該吸込口２２と吹出口２３とに跨がって配置され且つ該吸込口２２と吹出口２３の特定の開口縁２２ａ，２３ａと略平行な方向に移動自在とされその第１移動位置においては該吸込口２２と吹出口２３とを共に覆ってこれを全閉状態とし、第２移動位置においては該吸込口２２と吹出口２３とを共に開放してこれらを全開状態とする換気量調整板２１によりその開口面積が増減調整されるように構成しているので、上記吸込口２２と吹出口２３の全開状態においては上記換気量調整板２１の移動量に見合った大きな開口面積が確保され、例えば上記吸込口２２と吹出口２３を円形の開口としたような場合に比して、最大換気量の増加が図られ、特に球根等の大換気量を必要とする貨物の輸送に使用されるコンテナにおいて好適である。

【００３１】④　本願の第４の発明にかかるコンテナ用冷凍装置の換気構造によれば、上記③に記載の効果に加えて次のような効果が得られる。即ち、この発明では、上記吸込口２２及び吹出口２３の各開口縁のうち、上記換気量調整板２１の上記第１移動位置から第２移動位置側への移動方向においてその後方側に位置する後方開口縁２２ｂ，２３ｂを、上記換気量調整板２１の移動方向に直交する方向に対して所定の傾斜角をもった傾斜縁としているので、上記換気量調整板２１を移動させて上記吸込口２２及び吹出口２３を開口させる場合、その開口の初期段階（即ち、小換気量の範囲）においては該換気量調整板２１の移動に伴って上記吸込口２２及び吹出口２３が上記後方開口縁２２ｂ，２３ｂの傾斜に沿って徐々に開き、上記換気量調整板２１の移動量の変化に対する上記吸込口２２及び吹出口２３の開口面積の増加比率が低く抑えられる。従って、この小換気量範囲においては、換気量の微調整が容易となり、特に要求換気量は少ないがその微調整が要求される通常の野菜等の輸送に供せられるコンテナに好適な換気量調整特性とされる。

【００３２】一方、上記吸込口２２及び吹出口２３がそれぞれ上記後方開口縁２２ｂ，２３ｂの全域まで開いた後においては、該吸込口２２及び吹出口２３は上記換気量調整板２１の移動に伴って矩形状に開口面積を拡大しながら開き、最終的に全開した最大開度とされる。従って、この領域では上記換気量調整板２１の移動の変化に伴って上記吸込口２２及び吹出口２３の開口面積が比例的に変化するので該換気量調整板２１の操作による換気量調整が容易となり、さらに最大開度においては、上記換気量調整板２１の移動量に見合った大きな開口面積が確保され、例えば上記吸込口２２と吹出口２３を円形の開口としたような場合に比して、最大換気量の増加が図られ、特に球根等の大換気量を必要とする貨物の輸送に使用されるコンテナにおいて好適である。

【００３３】

【発明の実施の形態】以下、本願発明のコンテナ用冷凍装置の換気構造を好適な実施形態に即して具体的に説明する。

【００３４】第１の実施形態

図１～図４には、本願発明の換気構造の第１の実施形態であるコンテナ用の冷凍装置Ｚを示しているが、この冷凍装置Ｚの基本的構造は上述した従来の冷凍装置Ｚ。と同様であるため、ここでは従来の冷凍装置Ｚ。と同じ構成部材については図１１～図１４に付したと同一の符号を付して重複した説明を省略し、従来の冷凍装置Ｚ。と異なる構成のみについて詳述することにする。

【００３５】この冷凍装置Ｚにおいては、次述するように、従来の冷凍装置Ｚ。とは換気に関与する部分の構造が異なっている。

【００３６】第１の特有な構造は、換気口ユニット２０を構成する吸込口２２と吹出口２３の構造及び形成位置に関するものである。

【００３７】即ち、この実施形態における冷凍装置Ｚにおいては、上記吸込口２２と吹出口２３を共に矩形状の開口とするとともに、これら吸込口２２と吹出口２３とを、ケーシング２の上部に設けられた左右一対のサービス蓋１９，１９のうちの一方のサービス蓋１９に直接設けている。そして、これら吸込口２２と吹出口２３の上下方向における形成位置は、該吸込口２２が上記ファンガイド１７の上側（即ち、該ファン１５の吸込側）に位置し、該吹出口２３が上記ファンガイド１７とその下方に位置する上記蒸発器１８との中間（即ち、蒸発器１８

の一次側）に位置するように設定している。また、これら吸込口２２と吹出口２３の上記ファン１５に対する相対位置は、図３に示すように、これら吸込口２２と吹出口２３が共に該ファン１５の回転方向前方側において該ファン１５の周縁に近接するように設定している。従って、上記ファン１５から蒸発器１８側に向かって吹き出されて上記吹出口２３に流れる空気にはファン動圧が有効に作用することになる。

【００３８】さらに、上記サービス蓋１９の外板１９ａ上に開口する上記吸込口２２及び吹出口２３の下流側端部には、これらの開口面積を増減調整することで換気量調整を行う換気量調整板２１が配置されている。この換気量調整板２１は、図５～図７に示すように、上記サービス蓋１９の外板１９ａに沿って上下方向（即ち、上下方向において略同一線上に位置する上記吸込口２２の一方の開口縁２２ａと上記吹出口２３の一方の開口縁２３ａと平行な方向）にスライド可能とされた板状体で構成され、図５に示す最下動位置（特許請求の範囲中の「第１移動位置」に該当する）においては上記吸込口２２と吹出口２３とを同時に全閉し得る大きさをもつとともに、そのスライド方向中間位置には二つの開口２６，２７を上下方向に所定間隔をもってを形成している。従って、図６に示すように、換気量調整板２１が中間位置に設定された状態では、同図にハッチングを付したように上記吸込口２２の一部が上記開口２６に重合して該吸込口２２が半開されるとともに、上記吹出口２３が換気量調整板２１からはみ出してこれが半開される（換気口の半開状態）。さらに、図７に示すように、換気量調整板２１が最上動位置（特許請求の範囲中の「第２移動位置」に該当する）に設定された状態では、同図にハッチングを付したように上記吸込口２２が上記開口２６と開口２７とに同時に重合して該吸込口２２が全開されるとともに、上記吹出口２３の全域が換気量調整板２１からはみ出してこれが全開とされる（換気口の全開状態）。

【００３９】尚、上記サービス蓋１９は、図３に示すように、外板１９ａと内板１９ｂとの二重構造とされ、上記吸込口２２と吹出口２３とは、共にこのサービス蓋１９を板厚方向に貫通配置した管体で構成され、その一端は上記外板１９ａ上に開口し、他端は上記背面収納部８に臨んで開口している。

【００４０】第２の特有な構造は、上記吹出口２３にファン動圧が過度に作用するのを防止するための構造に関するものである。

【００４１】即ち、この実施形態のものにおいては、上記吹出口２３の上流側端部に次述する如き流通制御部材２５を配置している。この流通制御部材２５は、図８に示す如く上記吹出口２３の上縁に沿う上壁２５ａと該吹出口２３の一方の側縁（具体的には、上記ファン１５の回転方向の後方側に位置する側縁）に沿う側壁２５ｂとこれら上壁２５ａと側壁２５ｂとに跨がった略三角板状の前壁２５ｃとを備え、矩形筐状体をその対角線位置で二分割した如き形状とされている。そして、この流通制御部材２５は、その開口側を下方に向け、上記上壁２５ａを吹出口２３の上縁に、側壁２５ｂを吹出口２３の側縁にそれぞれ沿わせた状態で該吹出口２３の上流側端部に取り付けられる。従って、上記吹出口２３は、上記流通制御部材２５を取り付けることにより、上記ファン１５の回転方向後方寄りの対角線から上半分の部分が該流通制御部材２５によって覆われることになる。

【００４２】このような換気構造を備えることで、この実施形態の冷凍装置Ｚにおいては、従来の冷凍装置に比して、次のような特有な換気作用が得られるものである。

【００４３】即ち、この実施形態の冷凍装置Ｚにおいては、上記ケーシング２に、上記ファン１５の吸込側と庫外とを連通する換気用の吸込口２２と、上記蒸発器１８の一次側と庫外とを連通する換気用の吹出口２３をそれぞれ形成しているので、上記吸込口２２から吸い込まれた外気A_0と庫内を循環した後の庫内空気A_1との混合空気の一部が蒸発器１８において熱交換作用を受ける以前に排出空気A_1'として吹出口２３から庫外に吹き出される。従って、例えば熱交換後の空気の一部を排出空気として庫外に排出する従来の冷凍装置Ｚ。に比して、上記蒸発器１８において排出空気の熱交換を行わない分だけ庫内冷却に関与する空気に対する冷却作用が促進され、それだけ冷却効率が向上せしめられるものである。

【００４４】さらに、この実施形態の冷凍装置Ｚにおいては、上記吸込口２２及び吹出口２３を、上記ファン１５の回転方向前方側で且つ該ファン１５に近接する位置に設けることで、該ファン１５の動圧を吹出口２３から排出される排出空気に作用させる「動圧換気」を実現している。このため、例えば従来の「静圧換気」の場合のようにファン能力の増大を図らずとも、ファン動圧により上記吹出口２３からの空気の排出を促進させることができ、換気量の増大、即ち、換気能力の向上を図ることが可能となるものである。従って、例えば球根等のより多くの換気量を必要とする物を輸送する場合においても、容易にこれに対処することができ、それだけ冷凍装置Ｚの汎用性が向上するものである。

【００４５】ところが、単に「動圧換気」を採用したのみでは、吹出口２３から吹き出される排出空気A_1'にファン動圧の影響が過度となり、換気量の乱れの発生あるいは換気量調整の困難さという問題が生じ得ることは既述の通りである。

【００４６】しかしながら、この実施形態の冷凍装置Ｚにおいては、上記吹出口２３の上流側端部に上記流通制御部材２５を設けることで、上記の如き問題点を解消し、「動圧換気」の利点を最大限生かしながら、同時に換気量の安定化及び換気量調整の容易化を実現できるようになっている。即ち、上記吹出口２３の上流側端部に

上記流通制御部材２５を設けることで、該吹出口２３の上記ファン１５寄り部位が覆われ、該ファン１５から吹き出される空気流は該ファン１５から上記吹出口２３側に短絡的に流通することなく該流通制御部材２５の各壁２５ａ，２５ｂ，２５ｃに衝突してこれを迂回しながら上記吹出口２３側に流れる。このように迂回状態で排出空気Ａ，が吹出口２３側に流れることで該排出空気Ａ，に対するファン動圧の影響が適度に軽減され、この結果、吹出口２３を通して排出される空気量に対応する換気量の乱れが可及的に防止され、換気量が安定的に確保され、延いては設定換気量の維持が可能になるものである。

【００４７】また、上述のように上記流通制御部材２５の付設によって換気量が安定すること、及び上記吸込口２２と吹出口２３とを共に矩形の開口としたことの相乗効果として、換気口開度と換気量との相関関係がほぼ一定に保持される。具体的には図１０に示す試験結果の通り、流通制御部材２５を設けない場合には、「換気口開度－換気量」特性が大きく屈曲し、換気口開度に対する換気量の変化率が急増する部分とこれがほとんど変化しない部分とが生じるが、流通制御部材２５を設けた場合には、「換気口開度－換気量」特性がほぼ直線状となり、換気口開度と換気量との間に比例関係が生じる。従って、流通制御部材２５を備えたこの実施形態の冷凍装置Ｚにおいては、輸送対象貨物の種類等に応じて換気量を調整する場合、どれぐらいの換気口開度に設定すればどれぐらいの換気量が得られるということが判るため、換気量調整が極めて容易となるものである。

【００４８】尚、ここでは「換気口開度」を、上記換気口ユニット２０の換気量調整板２１の操作量で示している。

【００４９】また、図９には、図８に示した上記流通制御部材２５の変形例を示している。この変形例の流通制御部材２５は、上壁２５ａと左右一対の側壁２５ｂ，２５ｂと矩形状の前壁２５ｃとを備えてなり、該流通制御部材２５を吹出口２３に取り付けることにより該吹出口２３は該流通制御部材２５によりその全域が覆われ、該流通制御部材２５の下面側のみを介して上記ファン１５に臨むことになる。従って、上記実施形態における流通制御部材２５の場合よりもさらにファン動圧の影響を軽減できるものである。

【００５０】第２の実施形態

図１１及び図１３には、本願発明にかかるコンテナ用冷凍装置の換気構造の第２の実施形態における換気口ユニット２０部分を示している。尚、この第２の実施形態におけるコンテナ用冷凍装置の換気構造は、上記換気口ユニット２０の部分の構造のみが上記第１の実施形態における換気構造と異なり、それ以外の構成は全て同じであるため、ここではこの第２の実施形態に特有な上記換気口ユニット２０部分についてのみ詳述し、それ以外の部分の構成及び作用効果については上記第１の実施形態における説明を援用する。

【００５１】上記換気口ユニット２０は、上記サービス蓋１９上に開口する次述の吸込口２２及び吹出口２３と、該吸込口２２及び吹出口２３の開口面積を増減調整することで換気量調整を行う換気量調整板２１とで構成されている。

【００５２】上記吸込口２２と吹出口２３は、上記第１の実施形態における吸込口２２と吹出口２３と同様に矩形の開口を基本としつつ、その下側の開口縁２２ｂ，２３ｂ（それぞれ特許請求の範囲中の「後方開口縁」に該当する）を、上下方向に延びる一方の開口縁２２ａ，２３ａ（それぞれ特許請求の範囲中の「特定の開口縁」に該当する）に直交する方向に対して所定の傾斜角をもって傾斜する傾斜縁としている。

【００５３】上記換気量調整板２１は、上記サービス蓋１９の表面に沿って上下方向（即ち、上記吸込口２２及び吹出口２３の開口縁２２ａ，２３ａに平行な方向）にスライド可能とされた板状体で構成されるとともに、その上下方向中段位置には開口２６を備えている。そして、この換気量調整板２１は、図１１に示す最下動位置（特許請求の範囲中の「第１移動位置」に該当する）と図１３に示す最上動位置（特許請求の範囲中の「第２移動位置」に該当する）の範囲において上下方向にスライドされ、最下動位置においては上記吸込口２２と吹出口２３とを同時に全閉し、最上動位置においては上記吹出口２３から外れてこれを全開とするとともに上記開口２６が上記吹出口２３と重合することでこれを全開とするようになっている。尚、図１２及び図１３においては、上記吸込口２２と吹出口２３のうち、開口された部分にハッチングを付している。

【００５４】この第２の実施形態にかかるコンテナ用冷凍装置の換気構造によれば、上記吸込口２２及び吹出口２３の各開口縁のうち、上記換気量調整板２１の最下動位置から最上動位置側への移動方向（即ち、上方への開作動方向）においてその後方側（即ち、下方側）に位置する開口縁２２ｂ，２３ｂを、傾斜縁としているので、上記換気量調整板２１を移動させて上記吸込口２２及び吹出口２３を開口させる場合、図１２に示すような開口の初期段階（即ち、小換気量の範囲）においては、該換気量調整板２１の移動に伴って上記吸込口２２及び吹出口２３が上記各開口縁２２ｂ，２３ｂの傾斜に沿って徐々に開き、上記換気量調整板２１の移動量の変化に対する上記吸込口２２及び吹出口２３の開口面積の増加比率が低く抑えられる。従って、この小換気量範囲においては、換気量の微調整が容易となり、特に要求換気量は少ないがその微調整が要求される通常の野菜等の輸送に供せられるコンテナに好適な換気量調整特性が得られる。

【００５５】一方、上記吸込口２２及び吹出口２３がそれぞれ上記各開口縁２２ｂ，２３ｂの全域まで開いた後

においては、該吸込口２２及び吹出口２３は上記換気量調整板２１の移動に伴って矩形状に開口面積を拡大しながら開き、最終的に図１３に示す如き全開した最大開度とされる。従って、この作動範囲では上記換気量調整板２１の移動の変化に伴って上記吸込口２２及び吹出口２３の開口面積が比例的に変化するので該換気量調整板２１の操作による換気量調整が容易となる。また、最大開度に設定された状態においては、上記換気量調整板２１の移動量に見合った大きな開口面積が確保され、例えば上記吸込口２２と吹出口２３を円形の開口としたような場合に比して、最大換気量の増加が図られ、特に球根等の大換気量を必要とする貨物の輸送に使用されるコンテナの換気構造として好適である。

【図面の簡単な説明】

【図１】本願発明のコンテナ用冷凍装置の換気構造の第１の実施形態を示す正面図である。

【図２】図１のII部の背面側からの拡大図である。

【図３】図２のIII-III矢視図である。

【図４】図２のIV-IV矢視図である。

【図５】図１に示した換気口ユニットの換気量調整状態説明図である。

【図６】図１に示した換気口ユニットの換気量調整状態説明図である。

【図７】図１に示した換気口ユニットの換気量調整状態説明図である。

＊【図８】図２に示した動圧防止材の拡大斜視図である。

【図９】動圧防止材の変形例を示す斜視図である。

【図１０】「換気口開度－換気量」特性図である。

【図１１】本願発明のコンテナ用冷凍装置の換気構造の第２の実施形態における換気口ユニット部分の正面図である。

【図１２】図１１に示した換気口ユニットの換気量調整状態説明図である。

【図１３】図１１に示した換気口ユニットの換気量調整状態説明図である。

【図１４】従来の換気構造を備えたコンテナ用冷凍装置の正面図である。

【図１５】図１４のＸＶ部の背面側からの拡大図である。

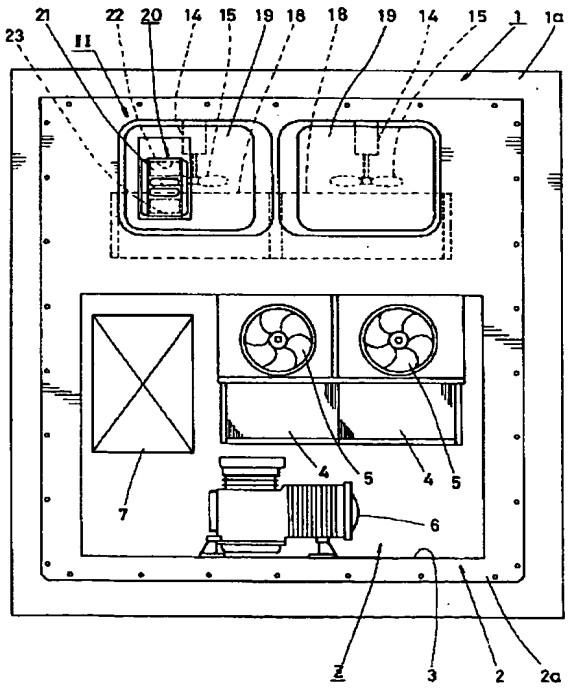
【図１６】図１５のXVI-XVI矢視図である。

【図１７】図１５のXVII-XVII矢視図である。

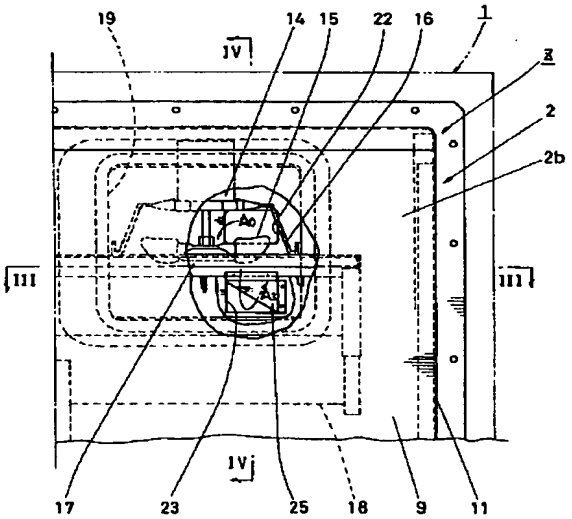
【符号の説明】

１はコンテナ、２はケーシング、３は前面収納部、４は凝縮器、５はファン、６は圧縮機、７はコントロールボックス、８は背面収納部、９は背面壁、１０は天板、１１は側板、１２は隔壁、１４はモータ、１５はファン、１６はステー、１７はファンガイド、１８は蒸発器、１９はサービス蓋、２０は換気口ユニット、２１は換気量調整板、２２は吸込口、２３は吹出口、２４は開口、２５は流通制御部材、２６及び２７は開口である。

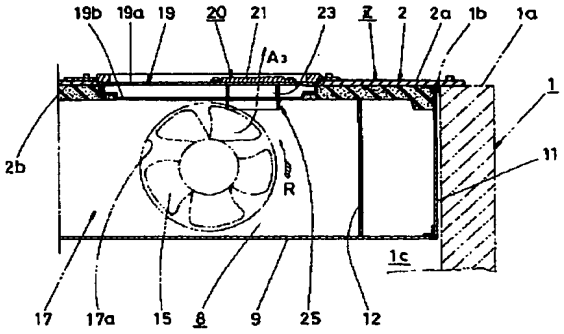
【図１】



【図２】



【図３】



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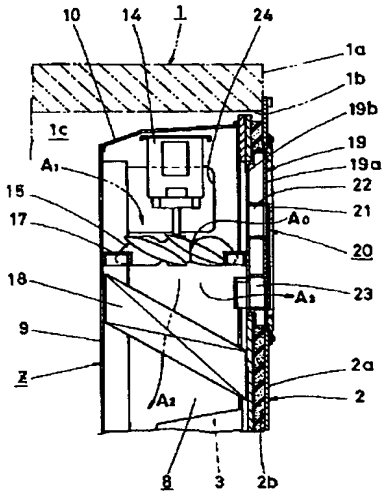

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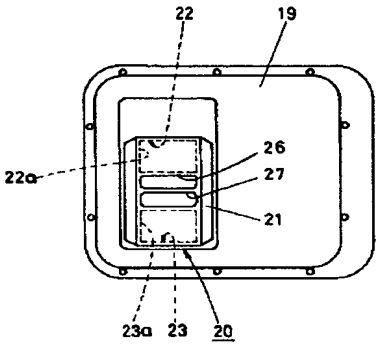

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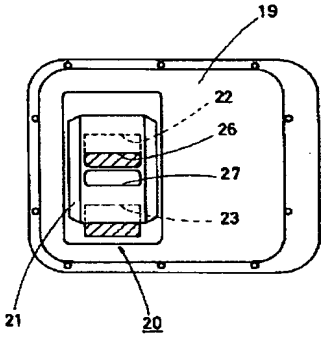

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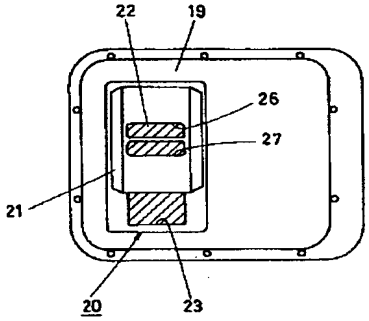

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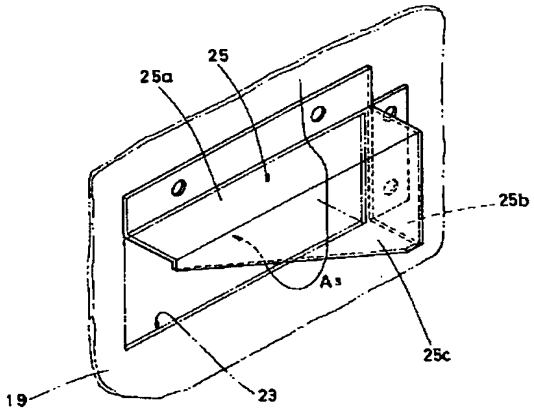
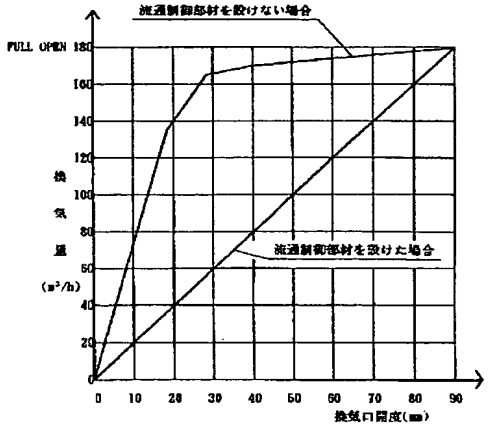


【図１０】



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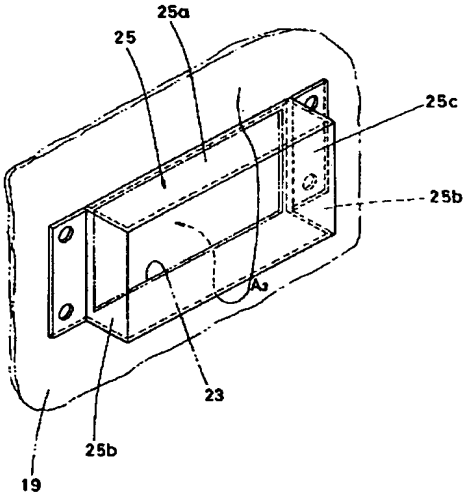
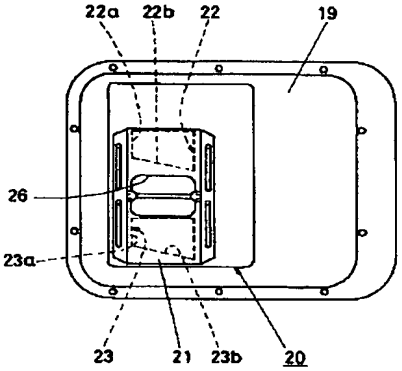
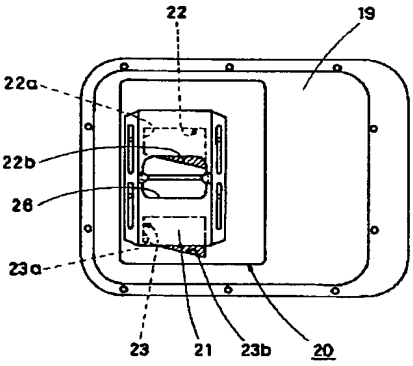


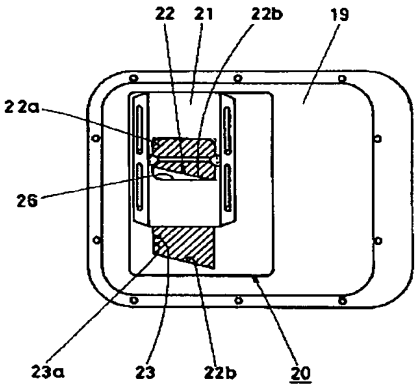
【図１１】



【図１２】



【図１３】



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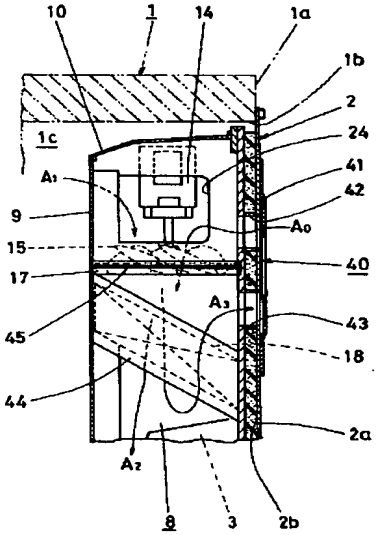

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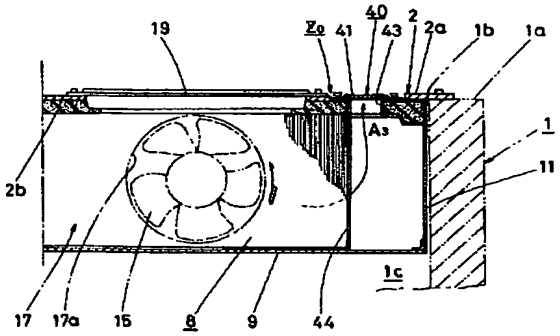
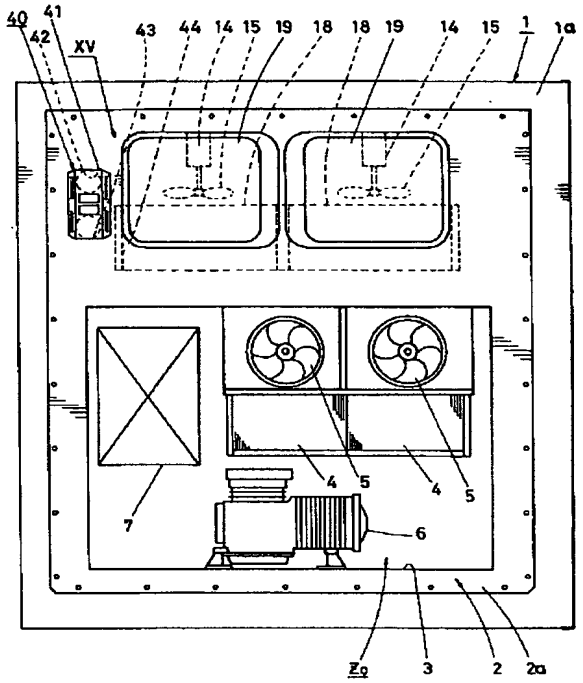


【図１４】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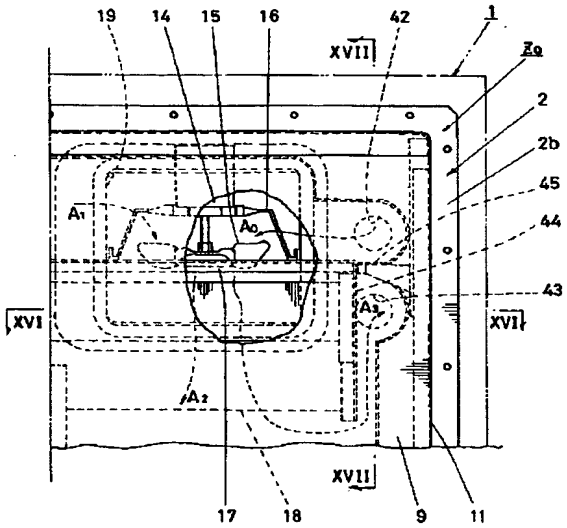
【図１５】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PATENT ABSTRACTS OF JAPAN

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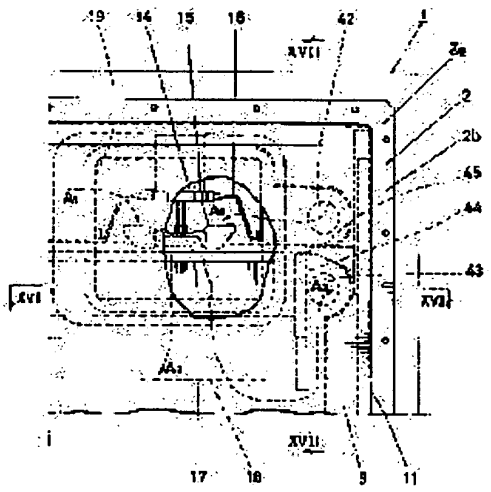
(71)Applicant : DAIKIN IND LTD
(72)Inventor : SAKAE SATORU
KAMEYAMA SHOZO

(30)Priority
Priority number : 08 25261 Priority date : 13.02.1996 Priority country : JP

(54) VENTILATION STRUCTURE OF REFRIGERATOR FOR CONTAINER USE

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a ventilation structure of refrigerator for a container which can readily control the ventilating quantity while achieving an improvement of cooling efficiency and satisfying a demand for a greater ventilating quantity.
SOLUTION: A casing 2 is provided with an intake opening 22 for ventilation which makes a suction side of a fan 15 communicate with an outside of a storage and a blow-off opening 23 for ventilation which makes a primary side of an evaporator 18 communicate with the outside of the storage. An outside air which is sucked through the intake opening 22 and an inside air which is obtained after circulation in the storage are mixed to form a mixture air and a part of this mixture air is blown off through the blow-off opening 23 as an exhaust gas without being subjected to a heat exchanging action by the evaporator 18 so as to ventilate the air inside the storage. Corresponding to an amount of the exhaust air which is not subjected to the heat exchange, a refrigerating action on the air used for an inside refrigeration is promoted so that a refrigerating efficiency is enhanced. Furthermore, in this case, since the intake opening 22 and the blow-off opening 23 are disposed at a position in front of the rotating direction of the fan 15 and adjacent to the fan 15, a dynamic ventilation can be realized. Furthermore, with the provision of a flow control member 25 at an upstream end of the blow-off opening 23, a ventilation amount can be increased by the dynamic ventilation, the ventilation action can be stabilized, and the ventilation amount can be readily controlled.



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[Date of sending the examiner's decision of rejection]	08.02.2005
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	
[Date of registration]	
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] In the lower part by the side of the front face (2a) which faces outside the warehouse of casing (2) attached so that this opening (1b) may be blockaded in opening (1b) prepared in the container (1), a condenser (4) In the upper part by the side of the tooth back (2b) which faces in a warehouse, while arranging an evaporator (18), respectively In the freezer for containers carried out as [make / it / to flow through towards secondary / which is located caudad / from the upstream which stations a fan (15) in the upper part location of the above-mentioned evaporator (18), and is located above the above-mentioned evaporator (18) in the air in a warehouse by this fan (15)] to the above-mentioned casing (2) Ventilation structure of the freezer for containers characterized by forming the outlet for ventilation (23) which opens for free passage the inlet port for ventilation (22) which opens an above-mentioned fan's (15)'s intake side and the outside of a warehouse for free passage, the upstream of the above-mentioned evaporator (18), and the outside of a warehouse, respectively.
[Claim 2] In claim 1, while preparing the above-mentioned inlet port (22) and an outlet (23) in the location which is the above-mentioned fan's (15)'s hand-of-cut front side, and approaches this fan (15) Near the upstream edge of the above-mentioned outlet (23) At least the above-mentioned fan (15) approach part of the above-mentioned outlet (23) Ventilation structure of the freezer for containers characterized by preparing the circulation control-section material (25) which controls blow-off airstream to circulate in the state of a detour, without the airstream which covers and blows off from this fan (15) circulating from this fan (15) simplistically to the above-mentioned outlet (23) side.
[Claim 3] In claim 1 or 2 the above-mentioned inlet port (22) and an outlet (23) It has both rectangular opening configurations. The opening edge of the specification of this inlet port (22) and an outlet (23) being arranged [and] ranging over this inlet port (22) and an outlet (23) (22a), Migration in an parallel direction is enabled, and cover [in / both / the 1st migration location] this inlet port (22) and an outlet (23), and this is made into a close-by-pass-bulb-completely condition. (23a) and abbreviation -- Ventilation structure of the freezer for containers characterized by being constituted so that increase and decrease of the opening area of adjustment may be carried out by the gas exchange baffle plate (21) which opens [in / both / the 2nd migration location] this inlet port (22) and an outlet (23), and makes these a full open condition.
[Claim 4] In claim 3 The inside of each opening edge of the above-mentioned inlet port (22) and an outlet (23), The back opening edge located in the back side in the migration direction from the above-mentioned 1st migration location of the above-mentioned gas exchange baffle plate (21) to the 2nd migration location side (22b), Ventilation structure of the freezer for containers characterized by considering as the inclination edge in which (23b) had a predetermined tilt angle to the direction which intersects perpendicularly in the migration direction of the above-mentioned gas exchange baffle plate (21).

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] The invention in this application relates to the ventilation structure of the freezer for containers.
[0002]
[Description of the Prior Art] the freezer for containers conventionally used especially for living thing transportation among these freezers for containers although the freezer for containers is used as an object for cooling in a warehouse of a container -- if it is, since it is necessary to ventilate the air in a warehouse moderately, the ventilation means has been established. It is as follows when the structure of the conventionally common freezer for containers equipped with such a ventilation means is briefly explained based on drawing 14 - drawing 17 .
[0003] The front view of the freezer Z0 attached in end side 1a of a container 1 is shown in drawing 14 . This freezer Z0 is equipped with the abbreviation rectangle tabular casing 2 attached so that this opening 1b may be blockaded in opening 1b prepared in end side 1a of the above-mentioned container 1. And the concave front stowage 3 was formed in the lower part of front 2a which faces outside the warehouse of a container 1 among both sides of this casing 2, and the condensers 4 and 4, the fans 5 and 5, the compressor 6, and control box 7 of a pair are held in this front stowage 3.
[0004] Moreover, the tooth-back stowage 8 surrounded by the tooth-back wall 9, the top plate 10, and side plates 11 and 11 is formed in the upper part location of the upper part 3 of tooth-back 2b of the above-mentioned casing 2 which attends 1in warehouse c of a container 1, i.e., the above-mentioned front stowage. and the vertical direction of this tooth-back stowage 8 -- the middle -- while the tabular fan guide 17 is installed horizontally in a location in the abbreviation level condition, fans 15 and 15 are stationed at the guide sections 17a and 17a of the shape of circular opening of this fan guide 17 of a Uichi Hidari pair, respectively. In addition, the rotation drive of this fan 15 is carried out by the motor 14 attached in the above-mentioned fan guide 17 through stay 16, and that hand of cut is made into the direction shown in drawing 16 by the feather arrow head R. Moreover, the opening 24 which opens this tooth-back stowage 8 and 1in warehouse c of a container 1 for free passage is formed in the location corresponding to an above-mentioned fan's 15 of flank of above-mentioned tooth-back stowage 8 intake side.
[0005] Furthermore, as it corresponds to each above-mentioned fans 15 and 15, evaporators 18 and 18 are arranged in the state of the downward inclination toward the casing 2 side in the lower part location of this fan guide 17, respectively. In addition, tube plates 44 and 44 are attached in the right-and-left both ends of these evaporators 18 and 18, respectively.
[0006] On the other hand, while the rectangle tabular service lids 19 and 19 are formed in the location corresponding to each above-mentioned fans 15 and 15 of the upper part of the above-mentioned casing 2, respectively, it is the side of one service lid 19 of the service lids 19 and 19 of these pairs, and the ventilating opening unit 40 is formed in the outside location of the tube plate 44 of the above-mentioned evaporator 18. The inlet port 42 which makes the part (namely, above-

mentioned fan's 15 intake sid[redacted]cated above the septum 45 by which [redacted]ventilating opening unit 40 follows the above-mentioned fan guide 17 of the above-mentioned tooth-back stowages 8, and this open for free passage outside a warehouse through opening 24, The part located below the septum 45 following the above-mentioned fan guide 17 of the above-mentioned tooth-back stowages 8, and this The outlet 43 which makes (namely, an above-mentioned fan's 15 intake side) open for free passage outside a warehouse in the condition of having passed the above-mentioned evaporator 18 and having bypassed from the tube plate 44 bottom to the outside of this tube plate 44, It consists of gas exchange baffle plates 41 which adjust a gas exchange by opening [it is prepared free / a slide in the vertical direction / on front 2a of the above-mentioned casing 2, and] and closing the above-mentioned inlet port 42 and an outlet 43 by the degree suitably according to the slide position. In addition, let both the above-mentioned inlet port 42 and the outlet 43 be circular openings.

[0007] Thus, in the constituted freezer Z0, the cooling operation in a warehouse and the ventilation operation in a warehouse are made as follows. That is, if the above-mentioned fan 15 is operated, while the open air A0 introduced by that suction effect from the air A1 in a warehouse and the above-mentioned inlet port 42 of 1in warehouse c will blow off to the upstream of an evaporator 18 by this fan 15 by the mixed state, the air which blew off to the upstream of this evaporator 18 is cooled because that whole quantity passes the above-mentioned evaporator 18. And most of this cooled air is again absorbed as air A1 in a warehouse after the circulation in a warehouse at a fan 15 side while it flows back to the 1in warehouse c side as cooling air A2 and performs the cooling operation in a warehouse.

[0008] On the other hand, other parts of the air which blew off to the upstream of the above-mentioned evaporator 18 bypass the above-mentioned tube plate 44 bottom, and are discharged outside a warehouse as discharge air A3 from the above-mentioned outlet 43. Ventilation of the air A1 in a warehouse is moderately performed by the exocytosis of the air from this outlet 43, and intake operation of the open air A0 from the above-mentioned inlet port 42. In addition, the dynamic pressure accompanying the blowdown from the fan 15 since the above-mentioned evaporator 18 after discharge air A3 blew off from the fan 15 in this case is passed, the above-mentioned tube plate 44 is bypassed further and it flows to an outlet 43 side will carry out attenuation disappearance, this will not contribute to a ventilation operation, and a ventilation operation will be chiefly performed by the static pressure difference between the outside of the inside of a warehouse, and a warehouse (that is, it is "static pressure ventilation").

[0009] The above is the structure of the conventional freezer Z0, and the outline of an operation.

[0010]

[Problem(s) to be Solved by the Invention] However, there were the following problems in such a conventional freezer Z0.

[0011] The 1st problem is a problem about cooling effectiveness. Namely, mix the air A1 in a warehouse after circulating through the open air A0 adopted from the outside of a warehouse, and 1in warehouse c in this freezer Z0, and it cools through these whole quantity to an evaporator 18. Since it discharges outside a warehouse by making a part of this cooled air into discharge air A3, the useless heat exchange operation which the above-mentioned evaporator 18 does not contribute to the cooling operation in a warehouse will be performed, and cooling effectiveness falls so much.

[0012] The 2nd problem is a problem of a gas exchange. That is, since this freezer Z0 is "static pressure ventilation" which ventilates as mentioned above using the static pressure difference of the inside of a warehouse, and the outside of a warehouse, it needs a fan's 15 capacity increase to take a large gas exchange, but since the magnitude of a container 1 has constraint, there is a fixed limitation in increase of a gas exchange. for this reason -- for example, when conveying what is performing the life object activity of a bulb etc. as a cargo, it may happen that these demand gas exchanges are not fully securable, either.

[0013] By the way, it is possible to aim at increase of a gas exchange by "dynamic pressure ventilation" using a fan velocity pressure as one of the approaches of canceling the lack of a gas

exchange by such "static pre[redacted]e ventilation." however, when it cons[redacted] as dynamic pressure ventilation, from whether a fa[redacted]elocity pressure is direct from an outlet to blow-off air, and it cutting Although increase of the gas exchange itself can be desired, on the other hand, with the metaphor gas exchange baffle plate 41 The opening of a ventilating opening It is confused greatly, without an actual gas exchange being fixed in a setting gas exchange, even if it holds uniformly (that is, it is the opening of inlet port 42 and an outlet 43, and corresponds to a setting gas exchange), or Even if the gas exchange baffle plate 41 adjusts the opening of a ventilating opening that a setting gas exchange should be changed, the opening and an actual gas exchange do not correspond. Depending on the case, a gas exchange will not change with small opening modification a lot than anticipation, a gas exchange will seldom change in spite of conversely big opening modification, but the problem that the adjustment actuation of a gas exchange itself becomes difficult will arise. From such a situation, as the ventilation approach of the freezer for containers, "static pressure ventilation" is adopted widely and dynamic pressure ventilation is not adopted from before.

[0014] The 3rd problem is a problem on a gas exchange adjustment function. Namely, although it is necessary for the cargo held in a container warehouse to carry out ventilation in this warehouse to a living thing ****** case In that case, the demand gas exchange which can be set is not fixed, for example, in the case of what is performing the life object activity of a bulb etc., a large gas exchange is required, but In the case of the usual vegetables or fruit, a small gas exchange is enough, and it is required that a gas exchange should moreover be finely tuned in this case according to the class of vegetables etc. within the limits of a small gas exchange.

[0015] By the way, as shown in drawing 14 , opening of inlet port 42 and the outlet 43 is both carried out circularly, and with the amount of slides of the gas exchange baffle plate 41 which carries out slide migration, increase and decrease of adjustment are carried out, and it has such opening area, and is made to adjust a gas exchange conventionally. for this reason, from the condition that the close by-pass bulb completely of both the above-mentioned inlet port 42 and the outlet 43 was carried out, for example by the above-mentioned gas exchange baffle plate 41 Make this gas exchange baffle plate 41 slide, and make the opening area of the above-mentioned inlet port 42 and an outlet 43 increase. (That is, a setting gas exchange is made to increase) a case -- the above-mentioned inlet port 42 and an outlet 43 -- the periphery top, since it opens making the angular distance increase from one point gradually For example, the increment ratio of the gas exchange to the amount of slides of the above-mentioned gas exchange baffle plate 41 is [in / as compared with the case like as / both / rectangular opening /, for the above-mentioned inlet port 42 and an outlet 43 / an opening initial stage (namely, small gas exchange range)] low, and fine tuning of a gas exchange is easy. This point can be said to be the gas exchange adjustment function to have been suitable for transportation of the usual vegetables with which there are few demand gas exchanges and fine tuning of a gas exchange is demanded, fruit, etc.

[0016] However, it sets in the condition that the above-mentioned gas exchange baffle plate 41 slid to the maximum location, and the above-mentioned inlet port 42 and an outlet 43 were considered as full open. From these inlet port 42 and an outlet 43 being circular openings, when this is made into rectangular opening, for example, it compares. Opening area of this inlet port 42 and an outlet 43 cannot secure maximal breathing capacity considering the amount of slides of the above-mentioned gas exchange baffle plate 41 fully easily few, and it becomes a problem when a large gas exchange is especially required like the time of transportation of a bulb.

[0017] Furthermore, when making the above-mentioned gas exchange baffle plate 41 slide and making the above-mentioned inlet port 42 and an outlet 43 into a full open condition from a close-by-pass-bulb-completely condition, change of the amount of openings of the above-mentioned inlet port 42 and the outlet 43 to change of the amount of slides of the above-mentioned gas exchange baffle plate 41 (namely, gas exchange) becomes extremely large [near these half-opening conditions], and fine tuning of the gas exchange in a half-opening condition becomes very difficult.

[0018] Since it is such, in a gas exchange adjustment top, in the opening initial stage of inlet port 42 and an outlet 43, fine tuning of a gas exchange is easy, a big opening area can be secured as much

as possible in the state of th[redacted] open, and operational characteristic[redacted] which the amount of openings of the above-mentioned inlet port 42 and an outlet 43 moreover changes-like proportionally to change of the amount of slides of the gas exchange baffle plate 41 in these midcourse phases is required.

[0019] So, in the invention in this application, the ventilation structure of the freezer for containers where both the improvement in cooling effectiveness, the correspondence to the increase demand of a gas exchange, and the ease of adjustment of a gas exchange can be realized tends to be proposed, and it is made.

[0020]

[Means for Solving the Problem] In the invention in this application, the following configurations are adopted as a concrete means for solving this technical problem.

[0021] In the lower part by the side of front 2a which faces outside the warehouse of the casing 2 attached so that this opening 1b may be blockaded in invention of the 1st of this application in opening 1b prepared in the container 1, a condenser 4 In the upper part by the side of tooth-back 2b which faces in a warehouse, while arranging an evaporator 18, respectively In the freezer for containers carried out as [make / it / to flow through towards secondary / which is located caudad / from the upstream which stations a fan 15 in the upper part location of the above-mentioned evaporator 18, and is located above the above-mentioned evaporator 18 in the air in a warehouse by this fan 15] It is characterized by forming the outlet 23 for ventilation which opens for free passage the inlet port 22 for ventilation which opens an above-mentioned fan's 15 intake side and the outside of a warehouse for free passage to the above-mentioned casing 2, the upstream of the above-mentioned evaporator 18, and the outside of a warehouse, respectively.

[0022] In invention of the 2nd of this application, in the ventilation structure of the freezer for containers concerning the 1st above-mentioned invention, while forming the above-mentioned inlet port 22 and an outlet 23 in the location which is the above-mentioned fan's 15 hand-of-cut front side, and approaches this fan 15 Near the upstream edge of the above-mentioned outlet 23 It is characterized by forming the circulation control-section material 25 which controls blow-off airstream to circulate in the state of a detour, without the airstream which covers the above-mentioned fan 15 approach part of the above-mentioned outlet 23 at least, and blows off from this fan 15 circulating from this fan 15 simplistically to the above-mentioned outlet 23 side.

[0023] In the ventilation structure of the freezer for containers applied to the 1st or 2nd above-mentioned invention in invention of the 3rd of this application It has both rectangular opening configurations for the above-mentioned inlet port 22 and an outlet 23. Migration in an parallel direction is enabled, and cover [in / both / the 1st migration location] this inlet port 22 and an outlet 23, and this is made into a close-by-pass-bulb-completely condition. it arranges ranging over this inlet port 22 and an outlet 23 -- having -- and the specific opening edges 22a and 23a of this inlet port 22 and an outlet 23 and abbreviation -- It is characterized by constituting and carrying out so that increase and decrease of the opening area of adjustment may be carried out by the gas exchange baffle plate 21 which opens [in / both / the 2nd migration location] this inlet port 22 and an outlet 23, and makes these a full open condition.

[0024] In the ventilation structure of the freezer for containers applied to the 3rd above-mentioned invention in invention of the 4th of this application The back opening edges 22b and 23b located in the back side in the migration direction from the above-mentioned 1st migration location of the above-mentioned gas exchange baffle plate 21 to the 2nd migration location side among each opening edge of the above-mentioned inlet port 22 and an outlet 23 It is characterized by considering as the inclination edge which had a predetermined tilt angle to the direction which intersects perpendicularly in the migration direction of the above-mentioned gas exchange baffle plate 21.

[0025]

[Effect of the Invention] In the invention in this application, the following effectiveness is acquired by considering as this configuration.

[0026] ** According to the ventilation structure of the freezer for containers concerning invention of the 1st of this application, since the outlet 23 for ventilation which opens for free passage the inlet port 22 for ventilation which opens an above-mentioned fan's 15 intake side and the outside of a warehouse for free passage to the above-mentioned casing 2, the upstream of the above-mentioned evaporator 18, and the outside of a warehouse is formed, respectively Before a part of mixed air with the air in a warehouse after circulating through the inside of the open air inhaled from the above-mentioned inlet port 22 and a warehouse receives a heat exchange operation in an evaporator 18, it will blow off from an outlet 23 outside a warehouse as discharge air, and ventilation in a warehouse will be performed by this. The cooling operation over the air which participates in cooling in a warehouse is promoted, and cooling effectiveness is made to improve so much as compared with the conventional freezer for containers which follows, for example, is discharged outside a warehouse by making a part of air after heat exchange into discharge air by only the part which does not perform heat exchange of discharge air in the above-mentioned evaporator 18.
[0027] According to the ventilation structure of the freezer for containers concerning invention of the 2nd of this application, first the above-mentioned inlet port 22 and an outlet 23 by the above-mentioned fan's 15 hand-of-cut front side to the 1st ** By and the thing to prepare in the location close to this fan 15 Since "dynamic pressure ventilation" to which this fan's 15 dynamic pressure is made to act on the discharge air discharged from an outlet 23 is realized For example, increase of fan capacity is not aimed at like [in the conventional "static pressure ventilation"], but discharge of the air from the above-mentioned outlet 23 is promoted, and ** can also aim at increase of a gas exchange easily.
[0028] Since the circulation control-section material 25 which controls blow-off airstream has been formed without the airstream which covers the above-mentioned fan 15 approach part of the above-mentioned outlet 23 at least to the 2nd, and blows off from this fan 15 near the upstream edge of the above-mentioned outlet 23 to it circulating from this fan 15 simplistically to the above-mentioned outlet 23 side so that it may circulate in the state of a detour, it is prevented that a fan velocity pressure acts on the discharge air which blows off from the above-mentioned outlet 23 too much. While turbulence of a gas exchange is prevented as much as possible and maintenance of a setting gas exchange is attained by this, the correlation of ventilating opening opening and a gas exchange is held almost uniformly, and it is closed if the gas exchange adjustment actuation by adjustment of ventilating opening opening is easy.
[0029] Therefore, the enhancement effect of the gas exchange by "dynamic-pressure ventilation" is obtained, the difficulty of turbulence and gas exchange adjustment of the gas exchange resulting from moreover adopting "dynamic-pressure ventilation" is canceled, and, according to the ventilation structure of the freezer for containers concerning this 2nd invention, stabilization of a gas exchange and easy-ization of gas exchange adjustment can attain with the effectiveness of "improvement in cooling effectiveness" indicated to the above-mentioned **.
[0030] ** According to the ventilation structure of the freezer for containers concerning invention of the 3rd of this application, in addition to the effectiveness of a publication, the following effectiveness is acquired by the above-mentioned ** or **. Namely, in this invention both, it has a rectangular opening configuration for the above-mentioned inlet port 22 and an outlet 23. Migration in an parallel direction is enabled, and cover [in / both / the 1st migration location] this inlet port 22 and an outlet 23, and this is made into a close-by-pass-bulb-completely condition. it arranges ranging over this inlet port 22 and an outlet 23 -- having -- and the specific opening edges 22a and 23a of this inlet port 22 and an outlet 23 and abbreviation -- Since it constitutes so that increase and decrease of the opening area of adjustment may be carried out by the gas exchange baffle plate 21 which opens [in / both / the 2nd migration location] this inlet port 22 and an outlet 23, and makes these a full open condition It compares, when a big opening area which balanced the movement magnitude of the above-mentioned gas exchange baffle plate 21 in the full open condition of the above-mentioned inlet port 22 and an outlet 23 is secured, for example, the above-mentioned inlet port 22 and an outlet 23 are used as circular opening. In the container used for transportation

of the cargo which the increment in maximal breathing capacity is achieved and needs large gas exchanges, such as a bulb, especially, it is suitable.

[0031] ** According to the ventilation structure of the freezer for containers concerning invention of the 4th of this application, in addition to the effectiveness of a publication, the following effectiveness is acquired by the above-mentioned **. In this invention, namely, the inside of each opening edge of the above-mentioned inlet port 22 and an outlet 23, The back opening edges 22b and 23b located in the back side in the migration direction from the above-mentioned 1st migration location of the above-mentioned gas exchange baffle plate 21 to the 2nd migration location side Since it is considering as the inclination edge which had a predetermined tilt angle to the direction which intersects perpendicularly in the migration direction of the above-mentioned gas exchange baffle plate 21 When the above-mentioned gas exchange baffle plate 21 is moved and opening of the above-mentioned inlet port 22 and the outlet 23 is carried out, In the initial stage (namely, the range of a small gas exchange) of the opening, the above-mentioned inlet port 22 and an outlet 23 open gradually along the inclination of the above-mentioned back opening edges 22b and 23b with migration of this gas exchange baffle plate 21. The increment ratio of the opening area of the above-mentioned inlet port 22 and the outlet 23 to change of the movement magnitude of the above-mentioned gas exchange baffle plate 21 is stopped low. Therefore, in this small gas exchange range, tuning [of a gas exchange] finely becomes easy, especially although there are few demand gas exchanges, they are made into the suitable gas exchange adjustment property for the container with which transportation of the usual vegetables with which that fine tuning is demanded is presented.

[0032] On the other hand, after the above-mentioned inlet port 22 and an outlet 23 open to the whole region of the above-mentioned back opening edges 22b and 23b, respectively, this inlet port 22 and an outlet 23 are opened expanding opening area in the shape of a rectangle with migration of the above-mentioned gas exchange baffle plate 21, and let them be the maximum opening finally opened fully. Therefore, since the opening area of the above-mentioned inlet port 22 and an outlet 23 changes-like proportionally with change of migration of the above-mentioned gas exchange baffle plate 21 in this field, the gas exchange adjustment by actuation of this gas exchange baffle plate 21 becomes easy. Furthermore, in the maximum opening, when a big opening area corresponding to the movement magnitude of the above-mentioned gas exchange baffle plate 21 is secured, for example, the above-mentioned inlet port 22 and an outlet 23 are used as circular opening, it compares. In the container used for transportation of the cargo which the increment in maximal breathing capacity is achieved and needs large gas exchanges, such as a bulb, especially, it is suitable.

[0033]

[Embodiment of the Invention] Hereafter, it is based on a suitable operation gestalt and the ventilation structure of the freezer for containers of the invention in this application is explained concretely.

[0034] Although the freezer Z for containers which is the 1st operation gestalt of the ventilation structure of the invention in this application is shown in the 1st operation gestalt drawing 1 - drawing 4 Since the fundamental structure of this freezer Z is the same as that of the conventional freezer Z0 mentioned above, The explanation which attached the same sign and overlapped having given drawing 11 - drawing 14 about the configuration member same here as the conventional freezer Z0 is omitted, and only a different configuration from the conventional freezer Z0 will be explained in full detail.

[0035] In this freezer Z, the structure of a part of participating in ventilation differs from the conventional freezer Z0 so that it may following-**.

[0036] The 1st characteristic structure is related with the structure and the formation location of inlet port 22 and an outlet 23 which constitute the ventilating opening unit 20.

[0037] That is, while using the above-mentioned inlet port 22 and an outlet 23 as rectangle-like opening, these inlet port 22 and an outlet 23 are directly formed [in / both / the freezer Z in this operation gestalt] in one service lid 19 of the service lids 19 and 19 of a Uichi Hidari pair in which it

was prepared in the upper pa[redacted] casing 2. And the formation location [redacted]e vertical direction of these inlet port 22 and an out[redacted]23 is set up so that this inlet port 22 may be located in the above-mentioned fan guide 17 bottom (namely, this fan's 15 intake side) and this outlet 23 may be located in the middle (namely, upstream of an evaporator 18) of the above-mentioned fan guide 17 and its above-mentioned evaporator 18 located caudad. Moreover, as shown in drawing 3 , the relative position to the above-mentioned fan 15 of these inlet port 22 and an outlet 23 is set up so that both these inlet port 22 and the outlet 23 may approach this fan's 15 hand-of-cut front side in this fan's 15 periphery. Therefore, a fan velocity pressure will act on the air which blows off from the above-mentioned fan 15 toward an evaporator 18 side, and flows to the above-mentioned outlet 23 effectively.

[0038] Furthermore, in the downstream edge of the above-mentioned inlet port 22 which carries out opening on shell plate 19a of the above-mentioned service lid 19, and an outlet 23, the gas exchange baffle plate 21 which performs gas exchange adjustment by carrying out increase and decrease of such opening area of adjustment is arranged. This gas exchange baffle plate 21 meets shell plate 19a of the above-mentioned service lid 19, as shown in drawing 5 - drawing 7 . The vertical direction It consists of plates whose slide in (namely, a direction parallel to one opening marginal 22a of the above-mentioned inlet port 22 and one opening marginal 23a of the above-mentioned outlet 23 which are located on an abbreviation same line in the vertical direction) was enabled. Two openings 26 and 27 are formed also for the magnitude which can carry out the close by-pass bulb completely of the above-mentioned inlet port 22 and the outlet 23 to coincidence in the maximum downward-moving position (it corresponds to the "1st migration location" in a patent claim) shown in drawing 5 , and ****** is formed in the vertical direction for predetermined spacing suddenly [both] in the slide direction mid-position. Therefore, as shown in drawing 6 , as hatching was given to this drawing, while a part of above-mentioned inlet port 22 carries out a polymerization to the above-mentioned opening 26 and this inlet port 22 is half-open, the above-mentioned outlet 23 overflows the gas exchange baffle plate 21, and this is half-open, where the gas exchange baffle plate 21 is set as the mid-position (half-opening condition of a ventilating opening). furthermore, as shown in drawing 7 , where the gas exchange baffle plate 21 is set as the maximum upward moving position (it corresponds to the "2nd migration location" in a patent claim) As hatching was given to this drawing, while the above-mentioned inlet port 22 carries out a polymerization to the above-mentioned opening 26 and opening 27 at coincidence and this inlet port 22 is opened fully, the whole region of the above-mentioned outlet 23 overflows the gas exchange baffle plate 21, and this is considered as full open (full open condition of a ventilating opening).

[0039] In addition, as the above-mentioned service lid 19 is shown in drawing 3 , it considers as the dual structure of shell plate 19a and inner-plate 19b, and consists of shells to which both the above-mentioned inlet port 22 and the outlet 23 carried out penetration arrangement of this service lid 19 in the direction of board thickness, and opening of that end is carried out on the above-mentioned shell plate 19a, the above-mentioned tooth-back stowage 8 is faced the other end, and it is carrying out opening.

[0040] The 2nd characteristic structure is related with the structure for preventing that a fan velocity pressure acts on the above-mentioned outlet 23 too much.

[0041] That is, in the thing of this operation gestalt, the **** circulation control-section material 25 which following-** at the upstream edge of the above-mentioned outlet 23 is arranged. This circulation control-section material 25 is equipped with front wall 25c of the shape of abbreviation 3 corner guard over upper wall 25a in alignment with the upper limb of the above-mentioned outlet 23, side-attachment-wall 25b which meets one side edge (side edge specifically located in the back side of the above-mentioned fan's 15 hand of cut) of this outlet 23, these upper wall 25a, and side-attachment-wall 25b as shown in drawing 8 , and it is made into the **** configuration where rectangle ****** was halved in that diagonal line location. And this circulation control-section material 25 is attached in the upstream edge of this outlet 23 in the condition that turn that opening side caudad, and meet the upper limb of an outlet 23 in the above-mentioned upper wall 25a, and it

made side-attachment-wall 2[illegible]meet the side edge of an outlet 23, re[illegible]tively. Therefore, when the above-mentioned outlet 2[illegible]ttaches the above-mentioned circulation control-section material 25, the part of an upper half will be covered with this circulation control-section material 25 from the diagonal line of the above-mentioned fan's 15 method approach of method Kogo of rotation.
[0042] By having such ventilation structure, the following characteristic ventilation operations are acquired in the freezer Z of this operation gestalt as compared with the conventional freezer.
[0043] Namely, it sets to the freezer Z of this operation gestalt. Since the outlet 23 for ventilation which opens for free passage the inlet port 22 for ventilation which opens an above-mentioned fan's 15 intake side and the outside of a warehouse for free passage to the above-mentioned casing 2, the upstream of the above-mentioned evaporator 18, and the outside of a warehouse is formed, respectively Before a part of mixed air with the air A1 in a warehouse after circulating through the inside of the open air A0 inhaled from the above-mentioned inlet port 22 and a warehouse receives a heat exchange operation in an evaporator 18, it blows off from an outlet 23 outside a warehouse as discharge air A3. The cooling operation over the air which participates in cooling in a warehouse is promoted, and cooling effectiveness is made to improve so much as compared with the conventional freezer Z0 which follows, for example, is discharged outside a warehouse by making a part of air after heat exchange into discharge air by only the part which does not perform heat exchange of discharge air in the above-mentioned evaporator 18.
[0044] Furthermore, in the freezer Z of this operation gestalt, it is forming the above-mentioned inlet port 22 and an outlet 23 in the location which is the above-mentioned fan's 15 hand-of-cut front side, and approaches this fan 15, and "dynamic pressure ventilation" to which this fan's 15 dynamic pressure is made to act on the discharge air discharged from an outlet 23 is realized. for this reason -- for example, increase of fan capacity is not aimed at like [in the conventional "static pressure ventilation"], but ** can also promote discharge of the air from the above-mentioned outlet 23 by the fan velocity pressure, and becomes possible [aiming at increase of a gas exchange, i.e., the improvement in ventilation capacity,]. When conveying the object which follows, for example, needs many gas exchanges from those, such as a bulb, this can be coped with easily, and the versatility of Freezer Z improves so much.
[0045] However, it is as stated above that the effect of a fan velocity pressure becomes excessive at discharge air A3 which only adopts "dynamic pressure ventilation" and blows off from an outlet 23 in a request, and the problem of the difficulty of generating of turbulence of a gas exchange or gas exchange adjustment may arise.
[0046] However, in the freezer Z of this operation gestalt, stabilization of a gas exchange and easy-ization of gas exchange adjustment can be realized to coincidence, canceling the trouble like the above and carrying out the advantage of "dynamic pressure ventilation" in the maximum student by forming the above-mentioned circulation control-section material 25 in the upstream edge of the above-mentioned outlet 23. That is, the airstream which the above-mentioned fan 15 approach part of this outlet 23 is covered by forming the above-mentioned circulation control-section material 25 in the upstream edge of the above-mentioned outlet 23, and blows off from this fan 15 flows to the above-mentioned outlet 23 side, colliding with each walls 25a, 25b, and 25c of this circulation control-section material 25, and bypassing this, without circulating from this fan 15 simplistically to the above-mentioned outlet 23 side. Thus, turbulence of the gas exchange corresponding to the air content which the effect of the fan velocity pressure to this discharge air A3 is moderately mitigated because discharge air A3 flows to an outlet 23 side in the state of a detour, consequently is discharged through an outlet 23 is prevented as much as possible, and a gas exchange is secured stably, as a result maintenance of a setting gas exchange is attained.
[0047] Moreover, the correlation of ventilating opening opening and a gas exchange is held almost uniformly as the synergistic effect of that a gas exchange is stabilized by the attachment of the above-mentioned circulation control-section material 25 as mentioned above, and having used both the above-mentioned inlet port 22 and the outlet 23 as rectangular opening. In not forming the circulation control-section material 25 as the test result specifically shown in drawing 10 , the part

into which a "ventilating ope[redacted]opening-gas exchange" property is c[redacted]ed greatly, and the rate of change of the gas exchange t[redacted]entilating opening opening increases rapidly, and the part from which this hardly changes arise, but when the circulation control-section material 25 is formed, a "ventilating opening opening-gas exchange" property becomes straight line-like mostly, and proportionality arises between ventilating opening opening and a gas exchange. Therefore, in the freezer Z of this operation gestalt equipped with the circulation control-section material 25, since it turns out that the gas exchange like which is obtained if it is set as the ventilating opening opening like which when adjusting a gas exchange according to the class of cargo for transportation etc., gas exchange adjustment becomes very easy.

[0048] In addition, the control input of the gas exchange baffle plate 21 of the above-mentioned ventilating opening unit 20 shows "ventilating opening opening" here.

[0049] Moreover, the modification of the above-mentioned circulation control-section material 25 shown in drawing 8 is shown in drawing 9 . By coming to have upper wall 25a, the side attachment walls 25b and 25b of a Uichi Hidari pair, and rectangle-like front wall 25c, and attaching this circulation control-section material 25 in an outlet 23, that whole region will be covered with this circulation control-section material 25, and the circulation control-section material 25 of this modification will face this outlet 23 the above-mentioned fan 15 only through the inferior-surface-of-tongue side of this circulation control-section material 25. Therefore, the effect of a fan velocity pressure is further mitigable from the case of the circulation control-section material 25 in the above-mentioned operation gestalt.

[0050] Ventilating opening unit 20 part in the 2nd operation gestalt of the ventilation structure of the freezer for containers concerning the invention in this application is shown in the 2nd operation gestalt drawing 11 and drawing 13 . In addition, since it is the same, all the other configurations explain the ventilation structure of the freezer for containers in this 2nd operation gestalt in full detail here only about the ventilating opening unit 20 above-mentioned part peculiar to this 2nd operation gestalt, and unlike ventilation structure [in / only in the structure of the part of the above-mentioned ventilating opening unit 20 / the operation gestalt of the above 1st], it uses the explanation in the operation gestalt of the above 1st about the configuration and the operation effectiveness of the other part.

[0051] The above-mentioned ventilating opening unit 20 consists of gas exchange baffle plates 21 which perform gas exchange adjustment by carrying out increase and decrease of the opening area of the inlet port 22 of the following ** and the outlet 23 which carry out opening on the above-mentioned service lid 19, and a this inlet port 22 and an outlet 23 of adjustment.

[0052] Like the inlet port 22 and the outlet 23 in the operation gestalt of the above 1st, on the basis of rectangular opening, while, the above-mentioned inlet port 22 and an outlet 23 the opening edges 22b and 23b (respectively -- a claim -- it corresponding to inner "back opening edge") of the bottom it is considering as the inclination edge which inclines with a predetermined tilt angle to the direction which while is prolonged in the vertical direction and intersects perpendicularly with it on the opening edges 22a and 23a (respectively -- a claim -- it corresponds to inner "specific opening edge").

[0053] while the above-mentioned gas exchange baffle plate 21 consists of plates whose slide in the vertical direction (namely, direction parallel to the opening edges 22a and 23a of the above-mentioned inlet port 22 and an outlet 23) was enabled along the front face of the above-mentioned service lid 19 -- the vertical direction -- the middle -- the location is equipped with opening 26. And this gas exchange baffle plate 21 is slid in the vertical direction in the range of the maximum upward moving position (it corresponds to the "2nd migration location" in a patent claim) shown in the maximum downward-moving position (it corresponds to the "1st migration location" in a patent claim) shown in drawing 11 , and drawing 13 . While carrying out the close by-pass bulb completely of the above-mentioned inlet port 22 and the outlet 23 to coincidence in the maximum downward-moving position, separating from the above-mentioned outlet 23 in the maximum upward moving position and considering this as full open, this is considered as full open because the above-

mentioned opening 26 carries [redacted] a polymerization to the above-menti[redacted] outlet 23. In addition, in drawing 12 and drawing 13 , h[redacted]ning is given to the part by which opening was carried out among the above-mentioned inlet port 22 and an outlet 23.

[0054] According to the ventilation structure of the freezer for containers concerning this 2nd operation gestalt The migration direction from the maximum downward-moving position of the above-mentioned gas exchange baffle plate 21 among each opening edge of the above-mentioned inlet port 22 and an outlet 23 to the maximum upward moving position side Since the opening edges 22b and 23b located in the back side (namely, lower part side) in (namely, the open actuation direction to the upper part) are used as the inclination edge In the initial stage (namely, the range of a small gas exchange) of opening when moving the above-mentioned gas exchange baffle plate 21 and carrying out opening of the above-mentioned inlet port 22 and the outlet 23, as shown in drawing 12 The above-mentioned inlet port 22 and an outlet 23 open gradually along the inclination of each above-mentioned opening edges 22b and 23b with migration of this gas exchange baffle plate 21, and the increment ratio of the opening area of the above-mentioned inlet port 22 and the outlet 23 to change of the movement magnitude of the above-mentioned gas exchange baffle plate 21 is stopped low. Therefore, in this small gas exchange range, tuning [of a gas exchange] finely becomes easy, especially although there are few demand gas exchanges, the suitable gas exchange adjustment property for the container with which transportation of the usual vegetables with which that fine tuning is demanded is presented is acquired.

[0055] On the other hand, after the above-mentioned inlet port 22 and an outlet 23 open to the whole region of each above-mentioned opening edges 22b and 23b, respectively, this inlet port 22 and an outlet 23 are opened expanding opening area in the shape of a rectangle with migration of the above-mentioned gas exchange baffle plate 21, and let them be the maximum opening which is finally shown in drawing 13 and which carried out **** full open. Therefore, in this actuation range, since the opening area of the above-mentioned inlet port 22 and an outlet 23 changes-like proportionally with change of migration of the above-mentioned gas exchange baffle plate 21, the gas exchange adjustment by actuation of this gas exchange baffle plate 21 becomes easy. Moreover, in the condition of having been set as the maximum opening, it is suitable as ventilation structure of the container used for transportation of the cargo which the increment in maximal breathing capacity is achieved and needs large gas exchanges, such as a bulb, especially as compared with a case as a big opening area corresponding to the movement magnitude of the above-mentioned gas exchange baffle plate 21 was secured, for example, the above-mentioned inlet port 22 and an outlet 23 were used as circular opening.

[Translation done.]

* NOTICES *

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the front view showing the 1st operation gestalt of the ventilation structure of the freezer for containers of the invention in this application.
[Drawing 2] It is an enlarged drawing from the tooth-back side of the II section of drawing 1 .
[Drawing 3] It is the III-III view Fig. of drawing 2 .
[Drawing 4] It is the IV-IV view Fig. of drawing 2 .
[Drawing 5] It is the gas exchange adjustment condition explanatory view of a ventilating opening unit shown in drawing 1 .
[Drawing 6] It is the gas exchange adjustment condition explanatory view of a ventilating opening unit shown in drawing 1 .
[Drawing 7] It is the gas exchange adjustment condition explanatory view of a ventilating opening unit shown in drawing 1 .
[Drawing 8] It is the expansion perspective view of the dynamic pressure prevention material shown in drawing 2 .
[Drawing 9] It is the perspective view showing the modification of dynamic pressure prevention material.
[Drawing 10] It is a "ventilating opening opening-gas exchange" property Fig.
[Drawing 11] It is the front view of the ventilating opening unit part in the 2nd operation gestalt of the ventilation structure of the freezer for containers of the invention in this application.
[Drawing 12] It is the gas exchange adjustment condition explanatory view of a ventilating opening unit shown in drawing 11 .
[Drawing 13] It is the gas exchange adjustment condition explanatory view of a ventilating opening unit shown in drawing 11 .
[Drawing 14] It is the front view of the freezer for containers equipped with the conventional ventilation structure.
[Drawing 15] It is an enlarged drawing from the tooth-back side of the XV section of drawing 14 .
[Drawing 16] It is the XVI-XVI view Fig. of drawing 15 .
[Drawing 17] It is the XVII-XVII view Fig. of drawing 15 .
[Description of Notations]
In a container and 2, casing and 3 a condenser and 5 for a front stowage and 4 A fan, [1] In 6, a compressor and 7 a tooth-back stowage and 9 for a control box and 8 A tooth-back wall, In a top plate and 11, a side plate and 12 a motor and 15 for a septum and 14 A fan, [10] 16 -- stay and 17 -- a fan guide and 18 -- an evaporator and 19 -- a service lid and 20 -- for inlet port and 23, as for opening and 25, circulation control-section material, and 26 and 27 are [a ventilating opening unit and 21 / a gas exchange baffle plate and 22 / an outlet and 24] openings.

[Translation done.]

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CLAIMS

[Claim(s)]
[Claim 1] By making it stand up, while having the front panel which has the display screen at least, the case which has receipt opening with which this removable panel can be absorbed, and the drive controlling mechanism which drives said removable panel and advancing said removable panel from said receipt opening In the drive control unit of the removable panel for mount which makes said display screen expose to the front-face side of said case The 1st detection means which detects the existence of the obstruction of the advance direction in said removable panel, and the 2nd detection means which detects the existence of the obstruction of the standing-up direction are established. If said 1st detection means outputs a predetermined detecting signal, advance actuation of said removable panel will be interrupted and it will shift to standing-up actuation. And the drive control unit of the removable panel for mount characterized by interrupting standing-up actuation of said removable panel, and shifting to advance actuation when said 2nd detection means outputted the predetermined detecting signal.

[Translation done.]